CLAIMS

We claim:

1. A method of tissue culturing processing comprising the steps of:
placing at least one explant in at least one pocket on an open surface of a porous framework;
defining a plurality of substantially uniform interstitial voids within said porous framework;
providing an undistorted growth transport field of said porous framework;
adding a first nourishment solution to said porous framework;
substantially uniformly distributing said first nourishment solution throughout said porous framework;
optimally balancing air to said first nourishment solution within said porous framework;
amply contacting at least part of said explant in said pocket to said first nourishment solution;
growing at least an initial growth of said explant on said porous framework;
adding a second nourishment solution to said porous framework;
balancing retentive exchange capacities with removal of exchange capacities of said first nourishment solution in said porous framework;
affirmatively removing said first nourishment solution from said porous framework with said second nourishment solution; and
secondarily growing said at least initially grown explant on said porous framework.

2. A method of tissue culturing processing comprising the steps of:
placing at least one explant in at least one pocket on an open surface of a porous framework;
providing an undistorted growth transport field of said porous framework;
adding at least one nourishment solution to said porous framework;
allowing said at least one nourishment solution to move throughout said undistorted growth transport field of said porous framework;
supplying said at least one nourishment solution to said explant; and

growing said explant on said porous framework.

3. A method of tissue culturing processing according to claim 2 wherein said step of providing an undistorted growth transport field of said porous framework comprises the step of providing said undistorted growth transport field adjacent to said explant.

4. A method of tissue culturing processing according to claim 2 wherein said step of placing at least one explant in at least one pocket on an open surface of a porous framework comprises the step of placing at least one explant in at least one pocket on an open surface of a non-deformable structure.

5. A method of tissue culturing processing according to claim 2 wherein said step of providing an undistorted growth transport field of said porous framework comprises the step of providing extended interstitial voids adjacent to said explant.

6. A method of tissue culturing processing comprising the steps of:
placing at least one explant on a surface of a porous framework;
adding at least one nourishment solution to said porous framework;
substantially uniformly distributing said at least one nourishment solution throughout said porous framework;
supplying said at least one nourishment solution to said explant; and
growing said explant on said porous framework.

7. A method of tissue culturing processing according to claim 6 and further comprising the steps of providing and maintaining sufficient exposure of air to said explant.

8. A method of tissue culturing processing according to claim 6 wherein said step of placing at least one explant on a surface of a porous framework comprises the step of placing said at least one explant in a pocket on a surface of a porous framework.

9. A method of tissue culturing processing according to claim 6 wherein said step of adding at least one nourishment solution to said porous framework comprises the step of adding a nourishment solution selected from the group consisting of nutrients, hormones, fertilizers, micro nutrients, macro nutrients, vitamins, and a carbohydrate source.

10. A method of tissue culturing processing according to claim 6 wherein said step of substantially uniformly distributing said at least one nourishment solution throughout said porous framework comprises the step of almost equally distributing said at least one nourishment solution throughout said porous framework.

11. A method of tissue culturing processing according to claim 7 wherein said step of maintaining sufficient exposure of air to said explant comprises the steps of providing and maintaining sufficient exposure of said explant to light.

12. A method of tissue culturing processing comprising the steps of:
placing at least one explant in at least one pocket on an open surface of a porous framework;
adding at least one nourishment solution to said porous framework;
amply contacting at least part of said explant in said pocket to said at least one nourishment solution; and
growing said explant on said porous framework.

13. A method of tissue culturing processing according to claim 12 wherein said step of amply contacting at least part of said explant in said pocket to said at least one nourishment solution comprises the step of contacting said at least one explant to a surface of said pocket at a percentage contact value, said percentage contact value selected from the group consisting of:

- greater than about 25%;
- greater than about 30%; and
- greater than about 35%.

14. A method of tissue culturing processing according to claim 12 wherein said step of amply contacting at least part of said explant in said pocket to said at least one nourishment solution comprises the step of contacting said explant to a surface of said pocket at a percentage contact value, said percentage contact value selected from the group consisting of:

- greater than about 15%;
- greater than about 20%;
- greater than about 25%;
- greater than about 30%; and
- greater than about 35%.

15. A method of tissue culturing processing according to claim 12 wherein said step of placing at least one explant in at least one pocket on an open surface of a porous framework comprises the step of placing said at least one explant in pocket size selected from the group consisting of:

- less than about 3.5 mm in length and about 2 mm in depth;
- less than about 3 mm in length 1.5 mm in depth;
- less than about 2.5 mm in length 1.5 mm in depth; and
- less than about 2.0 mm in length 1.0 mm in depth.

16. A method of tissue culturing processing comprising the steps of:

placing at least one explant on an open surface of a porous framework;

adding at least one nourishment solution to said porous framework;

optimally balancing air to said at least one nourishment solution within said porous framework;

supplying said at least one nourishment solution with said explant; and

growing said explant on said porous framework.

17. A method of tissue culturing processing according to claim 16 wherein said step of optimally balancing air to said at least one nourishment solution within said porous framework comprises the step of providing about a 50% of air and about a 50% of nourishment solution in said porous framework.

18. A method of tissue culturing processing according to claim 16 wherein said step of optimally balancing air to said at least one nourishment solution within said porous framework comprises the step of providing a ratio of air to nourishment solution selected from the group consisting of:

- about 20% air to about 80% nourishment solution;
- about 30% air to about 70% nourishment solution;
- about 40% air to about 60% nourishment solution;
- about 50% air to about 50% nourishment solution;
- about 60% air to about 40% nourishment solution;
- about 70% air to about 30% nourishment solution; and
- about 80% air to about 20% nourishment solution.

19. A method of tissue culturing processing according to claim 16 wherein said step of optimally balancing air to said at least one nourishment solution within said porous framework comprises the step of preventing vitrification of said explant.

20. A method of tissue culturing processing comprising the steps of:
placing at least one explant on an open surface of a porous framework;
defining a plurality of substantially uniform interstitial voids within said porous framework;
adding at least one nourishment solution to said porous framework;
allowing said at least one nourishment solution to move throughout said porous framework and at least some of said substantially uniform interstitial voids;
supplying said at least one nourishment solution to said explant; and
growing said explant on said porous framework.

21. A method of tissue culturing processing according to claim 20 wherein said step of defining a plurality of substantially uniform interstitial voids within said porous framework comprises the step of defining a plurality of substantially uniform interstitial voids having a size difference of less than about 25%.

22. A method of tissue culturing processing according to claim 20 wherein said step of defining a plurality of substantially uniform interstitial voids within said porous framework comprises the step of defining at least some large and at least some small voids.

23. A method of tissue culturing processing according to claim 22 wherein said step defining large and small voids comprises the step of providing a ratio of said large to small voids selected from the group consisting of:

- about 3 to about 40; and
- about 5 to about 40.

24. A method of tissue culturing processing according to claim 20 wherein said step of defining substantially uniform interstitial voids within said porous framework comprises the step of providing a total void volume of said porous structure selected from the group consisting of:

- about 10%;
- about 20%;
- about 30%;
- about 40%;
- about 50% and
- about 60%.

25. A method of tissue culturing processing comprising the steps of:

placing at least one explant in at least one pocket on a surface of a porous framework;

adding a first nourishment solution to said porous framework;

supplying said first nourishment solution to said explant;

growing at least an initial growth of said explant on said porous framework;

adding a second nourishment solution to said porous framework;

balancing retentive exchange capacities with removal exchange capacities of said first nourishment solution in said porous framework;

affirmatively removing said first nourishment solution from said porous framework with said second nourishment solution; and
secondarily growing said at least initially grown explants.

26. A method of tissue culturing processing according to claim 25 and further comprising the step of supplying said second nourishment solution to said at least initially grown explants.

27. A method of tissue culturing processing according to claim 25 wherein said step of adding said first and second nourishment solution comprises the step of adding said first and second nourishment solution from above said porous framework.

28. A method of tissue culturing processing according to claim 25 wherein said step of balancing retentive exchange capacities with removal exchange capacities of said first nourishment solution in said porous framework comprises the step of providing a removal pressure of said first nourishment solution greater than a retentive force of said first nourishment solution to said porous framework.

29. A method of tissue culturing processing according to claim 25 or 28 wherein said step of affirmatively removing said first nourishment solution from said porous framework with said second nourishment solution comprises the step of substantially removing said first nourishment solution from said porous framework.

30. A method of tissue culturing processing according to claim 25 wherein said step of adding said first and second nourishment solutions comprises the step of automatically adding said first and second nourishment solutions.

31. A method of tissue culturing processing according to claim 25 wherein said step of adding a second nourishment solution to said porous

framework comprises the step of adding a refresher solution of said first nourishment solution to said porous framework.

32. A method of tissue culturing processing according to claim 25 wherein said step of adding said first and second nourishment solutions comprises the step of selecting an application of said solutions from the group consisting of spraying, sprinkling, dripping, pouring, and injecting.

33. A method of tissue culturing processing comprising the steps of:
determining at least one transplant growth criterion appropriate to a given plant species;
placing a tissue culture growth media and a plurality of explants in a first environment;
nurturing at least an initial growth of said explants in said first environment;
establishing said at least one transplant growth criterion for a substantial portion of said plurality of initially grown explants while situated in said first environment;
extruding said initially grown explants and at least some of said tissue culture media from said first environment at a time when said transplant growth criterion is substantially established;
inserting said initially grown explants and at least some of said tissue culture media from said first environment in a second environment immediately after extruding said initially grown explants and at least some of said tissue culture media from said first environment; and
secondarily growing said initially grown explants.

34. A method of tissue culturing processing according to claim 33 and further comprising the steps of
supplying a synthetic retentive capability; and
maintaining said synthetic retentive capability during said step of extruding said initially grown explants and at least some of said tissue culture media from said first environment at a time when said transplant growth criterion is substantially established and said step of inserting said

initially grown explants and at least some of said tissue culture media from said first environment in a second environment immediately after extruding said initially grown explants and at least some of said tissue culture media from said first environment.

35. A method of tissue culturing processing according to claim 34 and further comprising the step of properly balancing said synthetic retentive capability with a plant yield ability.

36. A method of tissue culturing processing according to claim 33 wherein said step of placing a tissue culture growth media and a plurality of explants in a first environment comprises the step of placing said tissue culture growth media and a plurality of explants in a first matrix of transplant containers.

37. A method of tissue culturing processing according to claim 33 wherein said step of establishing said at least one transplant growth criterion for a substantial portion of said plurality of initially grown explants while situated in said first environment comprises the step of affirmatively establishing said at least one transplant growth criterion for a substantial portion of said plurality of initially grown explants while situated in said first environment.

38. A method of tissue culturing processing according to claim 33 wherein said steps of extruding said initially grown explants and at least some of said tissue culture media from said first environment at a time when said transplant growth criterion is substantially established and inserting said initially grown explants and at least some of said tissue culture media from said first environment in a second environment immediately after extruding said initially grown explants and at least some of said tissue culture media from said first environment comprises the step of simultaneously extruding said initially grown explants and at least some of said tissue culture media from said first environment at a time when said transplant growth criterion is substantially established and simultaneously

inserting said initially grown explants and at least some of said tissue culture media from said first environment in a second environment immediately after extruding said initially grown explants and at least some of said tissue culture media from said first environment.

39. A method of tissue culturing processing according to claim 33 wherein said step of inserting said initially grown explants and at least some of said tissue culture media from said first environment in a second environment immediately after extruding said initially grown explants and at least some of said tissue culture media from said first environment comprises the step of continuately inserting said initially grown explants and at least some of said tissue culture media from said first environment in a second environment immediately after extruding said initially grown explants and at least some of said tissue culture media from said first environment.

40. A method of tissue culturing processing according to claim 33 wherein said step of nurturing at least an initial growth of said explants in said first environment comprises the step of adding at least one nourishment solution to said tissue culture growth media and said explants.

41. A method of tissue culturing processing according to claim 33 wherein said step of placing a tissue culture growth media and a plurality of explants in a first environment comprises the step of placing said tissue culture growth media and said plurality of explants in dense population.

42. A method of tissue culturing processing according to claim 33 or 41 wherein said step of inserting said initially grown explants and at least some of said tissue culture media from said first environment in a second environment immediately after extruding said initially grown explants and at least some of said tissue culture media from said first environment comprises the step of inserting said initially grown explants and at least some of said tissue culture media from said first environment in a less dense population than said first environment immediately after extruding

said initially grown explants and at least some of said tissue culture media from said first environment.

43. A method of tissue culturing processing according to claim 33 and further comprising the steps of
growing said explant into a plantlet; and
placing said plantlet into a new medium selected from the group consisting of soil, peat moss, peat, bark, inorganic substances, organic substances, gravel, sand, natural substances, man-made substances, clay, liquid, finishing media, and prefinishing media.

44. A method of tissue culturing processing according to claim 6 or 25 wherein said step of placing at least one explant on a surface of a porous framework comprises the step of placing at least one explant on an open surface of said porous framework.

45. A method of tissue culturing processing according to claim 1, 2, 6, 12, 16, 20 or 25 wherein said step of placing at least one explant on a surface of a porous framework comprises the step of placing at least one explant on a surface of an only porous framework.

46. A method of tissue culturing processing according to claim 1, 2, 6, 12, 16, 20 or 25 wherein said step of placing at least one explant on a surface of a porous framework comprises the step of placing at least one explant on a surface of a porous multidirectional framework.

47. A method of tissue culturing processing according to claim 1, 2, 6, 12, 16, 20 or 25wherein said step of placing at least one explant on a surface of a porous framework comprises the step of placing a plurality of explants on a surface of a plurality of porous frameworks arranged in a web matrix.

48. A method of tissue culturing processing according to claim 47 and further comprising the step of uniformly growing said plurality of explants.

49. A method of tissue culturing processing according to claim 48 wherein said step of uniformly growing said plurality of explants comprises the step of providing substantially similar conditions for each of said plurality of explants.

50. A method of tissue culturing processing according to claim 49 wherein said step of providing substantially similar conditions for each of said plurality of explants comprises the steps of:
providing substantially similar explant specimens; and
providing substantially similar contact of said explants to said at least one nourishment solution.

51. A method of tissue culturing processing according to claim 48 wherein said step of uniformly growing said plurality of explants comprises the step of maturing said explants at a substantially similar rate.

52. A method of tissue culturing processing according to claim 48 wherein said step of uniformly growing said plurality of explants comprises the step of utilizing a controlled environment.

53. A method of tissue culturing processing according to claim 1, 2, 6, 12, 16, 20 or 25 and further comprising the step of allowing said nourishment solution to move throughout said porous framework by capillary action.

54. A method of tissue culturing processing according to claim 1, 6, 12 or 25 wherein said step of placing at least one explant on a surface of a porous framework comprises the step of selecting said porous framework from the group consisting of foam, a wettable open-celled polyurethane foam, a phenol-formaldehyde resin, non-ceramic fiberous material, a non-gel structure, expanded foams, fiberous materials and eligaard.

55. A method of tissue culturing processing according to claim 1, 2, 6, 12, 16, 20 or 25 wherein said step of growing said explant on said porous framework comprises the step of growing said explant into a plantlet.

56. A method of tissue culturing processing according to claim 55 and further comprising the step of placing said plantlet and at least some of said porous framework in a new medium.

57. A method of tissue culturing processing according to claim 56 wherein said step of placing said plantlet and at least some of said porous framework in said new medium comprises the step of selected said new medium from the group consisting of soil, peat moss, peat, bark, inorganic substances, organic substances, gravel, sand, natural substances, man-made substances, clay, liquid, finishing media, and prefinishing media.

58. A method of tissue culturing processing according to claim 1, 2, 6, 12, 16, 20 or 25 and further comprising the step of allowing said at least one explant to sorb said nourishment solution.

59. A method of tissue culturing processing according to claim 1, 2, 6, 12, 16, 20 or 25 and further comprising the step of situating said nourishment solution near said explant.

60. A method of tissue culturing processing according to claim 33 wherein said step of placing a tissue culture growth media and a plurality of explants in a first environment comprises the step of placing said plurality of explant on a surface of a porous framework and wherein said step of nurturing at least an initial growth of said explants in said first environment comprises the step of adding at least one nourishment solution to said porous framework.

61. A method of tissue culturing processing according to claim 2, 12, 16, 20, 25 or 60 and further comprising the step of substantially uniformly distributing said at least one nourishment solution throughout said porous framework.

62. A method of tissue culturing processing according to claim 1 or 61 wherein said step of substantially uniformly distributing said at least one nourishment solution throughout said porous framework comprises the step of almost equally distributing said at least one nourishment solution throughout said porous framework.

63. A method of tissue culturing processing according to claim 1, 2, 8, 16, 20 or 25 wherein said step of placing at least one explant on a surface of a porous framework comprises the step of placing said at least one explant in pocket size selected from the group consisting of:

- less than about 3.5 mm in length and about 2 mm in depth;
- less than about 3 mm in length 1.5 mm in depth;
- less than about 2.5 mm in length 1.5 mm in depth; and
- less than about 2.0 mm in length 1.0 mm in depth.

64. A method of tissue culturing processing according to claim 2, 6, 16, 20, 25 or 60 and further comprising the step of amply contacting at least part of said explant in said pocket to said at least one nourishment solution.

65. A method of tissue culturing processing according to claim 1 or 64 wherein said step of amply contacting at least part of said explant in said pocket to said at least one nourishment solution comprises the step of contacting said at least one explant to a surface of said pocket at a percentage contact value, said percentage contact value selected from the group consisting of:

- greater than about 25%;
- greater than about 30%; and
- greater than about 35%.

66. A method of tissue culturing processing according to claim 1 or 64 wherein said step of amply contacting at least part of said explant in said pocket to said at least one nourishment solution comprises the step of contacting said at least one explant to a surface of said pocket at a

percentage contact value, said percentage contact value selected from the group consisting of:

- greater than about 15%;
- greater than about 20%;
- greater than about 25%;
- greater than about 30%; and
- greater than about 35%.

67. A method of tissue culturing processing according to claim 2, 6, 12, 16, 20 or 60 wherein said step of adding at least one nourishment solution comprises the step of adding a first nourishment solution to said porous framework.

68. A method of tissue culturing processing according to claim 67 and further comprising the steps of:
adding a second nourishment solution to said porous framework;
balancing retentive exchange capacities with removal exchange capacities of said first nourishment solution in said porous framework; and
affirmatively removing said first nourishment solution from said porous framework with said second nourishment solution.

69. A method of tissue culturing processing according to claim 1 or 68 wherein said step of balancing retentive exchange capacities with removal exchange capacities of said first nourishment solution in said porous framework comprises the step of providing a removal pressure of said first nourishment solution greater than a retentive force of first nourishment solution to said porous framework.

70. A method of tissue culturing processing according to claim 1 or 68 wherein said step of affirmatively removing said first nourishment solution from said porous framework with said second nourishment solution comprises the step of substantially removing said first nourishment solution from said porous framework.

71. A method of tissue culturing processing according to 2, 6, 12, 16, 20 or 60 wherein said step of adding at least one nourishment solution comprises the step of selecting an application of said solutions from the group consisting of spraying, sprinkling, dripping, pouring and injecting.

72. A method of tissue culturing processing according to claim 1 or 68 wherein said step of adding a second nourishment solution to said porous framework comprises the step of adding a refresher solution of said first nourishment solution to said porous framework.

73. A method of tissue culturing processing according to claim 2, 6, 12, 16, 25 or 60 and further comprising the step of defining a plurality of substantially uniform interstitial voids within said porous framework.

74. A method of tissue culturing processing according to claim 1 or 73 wherein said step of defining a plurality of substantially uniform interstitial voids within said porous framework comprises the step of defining a plurality of substantially uniform interstitial voids having a size difference of less than about 25%.

75. A method of tissue culturing processing according to claim 1 or 73 wherein said step of defining a plurality of substantially uniform interstitial voids within said porous framework comprises the step of defining at least some large and at least some small voids.

76. A method of tissue culturing processing according to claim 1 or 75 wherein said step defining large and small voids comprises the step of providing a ratio of said large to small voids selected from the group consisting of:

- about 3 to about 40; and
- about 5 to about 40.

77. A method of tissue culturing processing according to claim 73 wherein said step of defining a plurality of substantially uniform interstitial voids

within said porous framework comprises the step of provide total void volume of said porous structure selected from the group consisting of:

- about 10%;
- about 20%;
- about 30%;
- about 40%;
- about 50% and
- about 60%.

78. A method of tissue culturing processing according to claim 6, 12, 16, 20, 25 or 60 and further comprising the step of providing an undistorted growth transport field of said porous framework.

79. A method of tissue culturing processing according to claim 1, 6, 12, 16, 20 or 25 wherein said step of placing at least one explant on a surface of a porous framework comprises the step of placing at least one explant in at least one pocket on an open surface of a non-deformable structure.

80. A method of tissue culturing processing according to claim 2, 6, 12, 20, 25 or 60 and further comprising the step of optimally balancing air to said at least one nourishment solution within said porous framework.

81. A method of tissue culturing processing according to claim 1 or 80 wherein said step of optimally balancing air to said at least one nourishment solution within said porous framework comprises the step of providing about a 50% of air and about a 50% of nourishment solution in said porous framework.

82. A method of tissue culturing processing according to claim 1 or 80 wherein said step of optimally balancing air to said at least one nourishment solution within said porous framework comprises the step of providing a ratio of air to nourishment solution selected from the group consisting of:

- about 20% air to about 80% nourishment solution;

- about 30% air to about 70% nourishment solution;
- about 40% air to about 60% nourishment solution;
- about 50% air to about 50% nourishment solution;
- about 60% air to about 40% nourishment solution;
- about 70% air to about 30% nourishment solution; and
- about 80% air to about 20% nourishment solution.

83. A method of tissue culturing processing according to claim 1, 2, 6, 12, 16, 20 or 25 wherein said step of placing said at least one explant on a surface of a porous framework comprises the step of placing a plurality of explants in a first environment.

84. A method of tissue culturing processing according to claim 83 wherein said step of placing a plurality of explants in a first environment comprises the step of automatically placing a plurality of explants in a first environment.

85. A method of tissue culturing processing according to claim 83 wherein said step of placing a plurality of explants in a first environment comprises the step of placing a plurality of explants in a dense population.

86. A method of tissue culturing processing according to claim 83 and further comprising the steps of:

nurturing at least an initial growth of said explants in said first environment;

extruding said initially grown explants and at least some of said porous framework from said first environment;

inserting said initially grown explants and at least some of said porous framework from said first environment in a second environment immediately after extruding said initially grown explants and at least some of said porous framework from said first environment.

87. A method of tissue culturing processing according to claim 86 wherein said steps of extruding and inserting comprises the step of automatically extruding and inserting.

88. A method of tissue culturing processing according to claim 86 wherein said inserting said initially grown explants and at least some of said porous framework from said first environment in a second environment immediately after extruding said initially grown explants and at least some of said porous framework from said first environment comprises the step of inserting said initially grown explants and at least some of said porous framework from said first environment in a less dense population than said first environment immediately after extruding said initially grown explants and at least some of said porous framework from said first environment.

89. A method of tissue culturing processing according to claim 86 and further comprising the steps of
supplying a synthetic retentive capability; and
maintaining said synthetic retentive capability during said step of extruding said initially grown explants and at least some of said tissue culture media from said first environment at a time when said transplant growth criterion is substantially established and said step of inserting said initially grown explants and at least some of said tissue culture media from said first environment in a second environment immediately after extruding said initially grown explants and at least some of said tissue culture media from said first environment.

90. A method of tissue culturing processing according to claim 89 and further comprising the step of properly balancing said synthetic retentive capability with a plant yield ability.

91. A method of tissue culturing processing according to claim 1, 2, 6, 12, 16, 20 or 25 wherein said step of placing at least one explant on a surface of a porous framework comprises the step of automatically placing at least one explant on a surface of a porous framework.

92. A method of tissue culturing processing according to claim 1, 2, 6, 12, 16 or 20 wherein said step of adding said nourishment solution to said porous framework comprises the step of automatically adding said nourishment solution to said porous framework.

93. A method of tissue culturing processing according to claim 1, 2, 6, 12, 16 or 20 and further comprising the step of automatically transplanting said explant and at least some of said porous framework to another environment.

94. A sustentacular tissue culture device comprising:
an open surface multidirectional porous framework having at least one pocket, said open surface multidirectional porous framework capable of substantial uniform distribution of a nourishment solution;
a plurality of substantially uniform interstitial voids defined by said open surface multidirectional porous framework;
an undistorted growth transport field of said porous framework;
at least one explant located in said at least one pocket on said open surface multidirectional porous framework;
an ample contact between at least part of said explant and said pocket;
a nourishment solution distributor; and
an affirmative nourishment solution eliminator.

95. A sustentacular tissue culturing device comprising:
an open surface multidirectional porous framework;
an undistorted growth transport field of said porous framework; and
at least one explant located on a surface of said open surface multidirectional porous framework.

96. A sustentacular tissue culturing device according to claim 95 wherein said undistorted growth transport field comprises an undistorted growth transport field adjacent to said at least one explant.

97. A sustentacular tissue culturing device according to claim 95 wherein said open surface multidirectional porous framework comprises a non-deformable structure.

98. A sustentacular tissue culturing device according to claim 95 wherein said undistorted growth transport field comprises extended interstitial voids adjacent said at least one explant.

99. A sustentacular tissue culturing device comprising:
an open surface multidirectional porous framework capable of substantial uniform distribution of a nourishment solution; and
at least one explant located on a surface of said open surface multidirectional porous framework.

100. A sustentacular tissue culturing device according to claim 99 wherein said open surface multidirectional porous framework comprises said open surface multidirectional porous framework having at least one pocket.

101. A sustentacular tissue culturing device according to claim 99 wherein said nourishment solution comprises a nourishment solution selected from the group consisting of nutrients, hormones, fertilizers, micro nutrients, macro nutrients, vitamins, and a carbohydrate source.

102. A sustentacular tissue culturing device according to claim 99 wherein said open surface multidirectional porous framework capable of substantial uniform distribution of a nourishment solution comprises an open surface multidirectional porous framework capable of almost equal distribution of said nourishment solution throughout said open surface multidirectional porous framework.

103. A sustentacular tissue culture device comprising:
an open surface multidirectional porous framework having at least one pocket;

at least one explant located in said at least one pocket on said open surface multidirectional porous framework; and

an ample contact between at least part of said explant and said pocket.

104. A sustentacular tissue culturing device according to claim 103 wherein said ample contact between at least part of said explant and said pocket comprises a percentage contact value selected from the group consisting of:

- greater than about 25%;
- greater than about 30%; and
- greater than about 35%.

105. A sustentacular tissue culturing device according to claim 103 wherein said ample contact between at least part of said explant and said pocket comprises a percentage contact value selected from the group consisting of:

- greater than about 15%;
- greater than about 20%;
- greater than about 25%;
- greater than about 30%; and
- greater than about 35%.

106. A sustentacular tissue culturing device according to claim 103 wherein said pocket comprises a pocket size selected from the group consisting of:

- less than about 3.5 mm in length and about 2 mm in depth;
- less than about 3 mm in length 1.5 mm in depth;
- less than about 2.5 mm in length 1.5 mm in depth; and
- less than about 2.0 mm in length 1.0 mm in depth.

107. A sustentacular tissue culturing device according to claim 103 wherein said ample contact between at least part of said explant and said pocket comprises ample contact between at least part of said explant and a nourishment solution.

108. A sustentacular tissue culture device comprising:
an open surface multidirectional porous framework;
at least one explant located on a surface of said open surface multidirectional porous framework; and
an optimal balance of air and a nourishment solution within said open surface multidirectional porous framework.

109. A sustentacular tissue culturing device according to claim 108 wherein said optimal balance of air and a nourishment solution within said open surface multidirectional porous framework comprises about a 50% of air and about a 50% of nourishment solution.

110. A sustentacular tissue culturing device according to claim 108 wherein said optimal balance of air and a nourishment solution within said open surface multidirectional porous framework comprises a ratio of air to nourishment solution selected from the group consisting of:

- about 20% air to about 80% nourishment solution;
- about 30% air to about 70% nourishment solution;
- about 40% air to about 60% nourishment solution;
- about 50% air to about 50% nourishment solution;
- about 60% air to about 40% nourishment solution;
- about 70% air to about 30% nourishment solution; and
- about 80% air to about 20% nourishment solution.

111. A sustentacular tissue culturing device comprising:
an open surface multidirectional porous framework;
a plurality of substantially uniform interstitial voids defined by said open surface multidirectional porous framework; and
at least one explant located on a surface of said open surface multidirectional porous framework.

112. A sustentacular tissue culturing device according to claim 111 wherein said plurality of substantially uniform interstitial voids comprises a size difference of less than about 25%.

113. A sustentacular tissue culturing device according to claim 111 wherein said plurality of substantially uniform interstitial voids comprises at least some large and at least some small voids.

114. A sustentacular tissue culturing device according to claim 113 wherein said at least some large and at least some small voids comprises a ratio of said large to small voids selected from the group consisting of:

- about 3 to about 40; and
- about 5 to about 40.

115. A sustentacular tissue culturing device according to claim 111 wherein said plurality of substantially uniform interstitial voids comprises a total void volume of said porous structure selected from the group consisting of:

- about 10%;
- about 20%;
- about 30%;
- about 40%;
- about 50% and
- about 60%.

116. A sustentacular tissue culturing device comprising:
an open surface multidirectional porous framework having at least one pocket on said open surface multidirectional porous framework;
a nourishment solution distributor;
an affirmative nourishment solution eliminator; and
at least one explant located in said at least one pocket on said open surface multidirectional porous framework.

117. A sustentacular tissue culturing device according to claim 116 wherein said nourishment solution distributor comprises a nourishment solution distributor located above said open surface multidirectional porous framework.

118. A sustentacular tissue culturing device according to claim 116 wherein said open surface multidirectional porous framework comprises a nourishment solution exchange capacity and nourishment solution removal capacity balance element.

119. A sustentacular tissue culturing device according to claim 116 wherein said affirmative nourishment solution eliminator comprises a removal pressure of a nourishment solution greater than a retentive force said nourishment solution.

120. A sustentacular tissue culturing device according to claim 116 or 119 wherein said affirmative nourishment solution eliminator comprises a substantial nourishment solution remover element.

121. A sustentacular tissue culturing device according to claim 116 wherein said nourishment solution distributor comprises an automatic nourishment solution distributor.

122. A sustentacular tissue culturing device according to claim 116 wherein said nourishment solution distributor comprises a distributor selected from the group consisting of a first nourishment solution distributor, a second nourishment solution distributor, and a refresher nourishment solution distributor.

123. A sustentacular tissue culturing device comprising:
a plurality of explant transplant containers within which an explant growth is impacted by a punch-transplant device;
a yieldable exit element established on a bottom of said plurality of explant transplant containers;
a tissue culture growth medium contained by said plurality of explant transplant containers; and
a plurality of explants contained within said explant transplant containers and responsive to said growth medium.

124. A sustentacular tissue culturing device according to claim 123 and further comprising a synthetic retentive capability.

125. A sustentacular tissue culturing device according to claim 124 and further comprising a proper balance of said synthetic retentive capability with a plant yield ability.

126. A sustentacular tissue culturing device according to claim 123 wherein said explant transplant containers comprises a first matrix of explant transplant containers.

127. A sustentacular tissue culturing device according to claim 123 and further comprising a nourishment solution contained within said explant transplant containers.

128. A sustentacular tissue culturing device according to claim 123 wherein explant transplant containers comprises a dense population of said plurality of explants.

129. A sustentacular tissue culturing device according to claim 123 or 128 and further comprising post transplant containers in a less dense population than said explant transplant containers.

130. A sustentacular tissue culturing device according to claim 94, 95, 99, 103, 108, 111 or 116 wherein said open surface multidirectional porous framework consists only of an open surface multidirectional porous framework.

131. A sustentacular tissue culturing device according to claim 94, 95, 99, 103, 108, 111 or 116 wherein said open surface multidirectional porous framework comprises a web matrix with a plurality of explants.

132. A sustentacular tissue culturing device according to claim 131 and further comprising substantially similar conditions for each of said plurality of explants.

133. A sustentacular tissue culturing device according to claim 132 wherein said substantially similar conditions comprises substantially similar explant specimens and substantially similar contact of said explants to a pocket.

134. A sustentacular tissue culturing device according to claim 131 and further comprising a controlled environment.

135. A sustentacular tissue culturing device according to claim 94, 95, 99, 103, 108, 111 or 116 and further comprising a capillarity system.

136. A sustentacular tissue culturing device according to claim 94, 99, 103 or 116 wherein said open surface multidirectional porous framework comprises selecting a open surface multidirectional porous framework from the group consisting of foam, a wettable open-celled polyurethane foam, a phenol-formaldehyde resin, non-ceramic fiberous material, a non-gel structure, expanded foams, fiberous materials and eligaard.

137. A sustentacular tissue culturing device according to claim 94, 95, 99, 103, 108, 111 or 116 and further comprising an explant sorbent element.

138. A sustentacular tissue culturing device according to claim 94, 95, 99, 103, 108, 111 or 116 and further comprising said a nourishment solution located near said at least one explant.

139. A sustentacular tissue culturing device according to claim 123 wherein said tissue culture growth medium comprises open surface multidirectional porous framework.

140. A sustentacular tissue culturing device according to claim 95, 103, 108, 111, 116 or 139 wherein said open surface multidirectional porous framework comprises open surface multidirectional porous framework capable of substantial uniform distribution of a nourishment solution.

141. A sustentacular tissue culturing device according to claim 94 or 140 wherein said open surface multidirectional porous framework capable of substantial uniform distribution of a nourishment solution comprises an open surface multidirectional porous framework capable of almost equal distribution of a nourishment solution throughout said open surface multidirectional porous framework.

142. A sustentacular tissue culturing device according to claim 94, 95, 100, 108, 111 or 116 wherein said pocket comprises a pocket size selected from the group consisting of:

- less than about 3.5 mm in length and about 2 mm in depth;
- less than about 3 mm in length 1.5 mm in depth;
- less than about 2.5 mm in length 1.5 mm in depth; and
- less than about 2.0 mm in length 1.0 mm in depth.

143. A sustentacular tissue culturing device according to claim 95, 99, 108, 111, 116 or 139 and further comprising an ample contact between at least part of said explant and said pocket.

144. A sustentacular tissue culturing device according to claim 94 or 143 wherein said ample contact between at least part of said explant and said pocket comprises a percentage contact value selected from the group consisting of:

- greater than about 25%;
- greater than about 30%; and
- greater than about 35%.

145. A sustentacular tissue culturing device according to claim 94 or 143 wherein said ample contact between at least part of said explant and said

pocket comprises a percentage contact value selected from the group consisting of:

- greater than about 15%;
- greater than about 20%;
- greater than about 25%;
- greater than about 30%; and
- greater than about 35%.

146. A sustentacular tissue culturing device according to claim 95, 99, 103, 108, 111 or 139 and further comprising a nourishment solution distributor and an affirmative nourishment solution eliminator.

147. A sustentacular tissue culturing device according to claim 146 wherein said open surface multidirectional porous framework comprises a nourishment solution exchange capacity and nourishment solution removal capacity balance element within said open surface multidirectional porous framework.

148. A sustentacular tissue culturing device according to claim 94 or 147 wherein said affirmative nourishment solution eliminator comprises a removal pressure of a nourishment solution greater than a retentive force said nourishment solution.

149. A sustentacular tissue culturing device according to claim 94 or 146 wherein said affirmative nourishment solution eliminator comprises a substantial nourishment solution remover element.

150. A sustentacular tissue culturing device according to claim 94 or 146 wherein said nourishment solution distributor comprises a distributor selected from the group consisting of a first nourishment solution distributor, a second nourishment solution distributor, and a refresher nourishment solution distributor.

151. A sustentacular tissue culturing device according to claim 95, 99, 103, 108, 116 or 139 and further comprising a plurality of substantially uniform interstitial voids defined by said open surface multidirectional porous framework.

152. A sustentacular tissue culturing device according to claim 94 or 151 wherein said plurality of substantially uniform interstitial voids comprises a size difference of less than about 25%.

153. A sustentacular tissue culturing device according to claim 94 or 151 wherein said plurality of substantially uniform interstitial voids comprises at least some large and at least some small voids.

154. A sustentacular tissue culturing device according to claim 94 or 153 wherein said at least some large and at least some small voids comprises a ratio of said large to small voids selected from the group consisting of:

- about 3 to about 40; and
- about 5 to about 40.

155. A sustentacular tissue culturing device according to claim 151 wherein said plurality of substantially uniform interstitial voids comprises a total void volume of said porous structure selected from the group consisting of:

- about 10%;
- about 20%;
- about 30%;
- about 40%;
- about 50% and
- about 60%.

156. A sustentacular tissue culturing device according to claim 99, 103, 108, 111, 116 or 139 and further comprising an undistorted growth transport field of said open surface multidirectional porous framework.

157. A sustentacular tissue culturing device according to claim 94, 99, 103, 108, 111 or 116 wherein said open surface multidirectional porous framework comprises a non-deformable structure.

158. A sustentacular tissue culturing device according to claim 94, 95, 99, 103, 111, 116 or 139 and further comprising an optimal balance of air and a nourishment solution within said open surface multidirectional porous framework.

159. A sustentacular tissue culturing device according to claim 158 wherein said an optimal balance of air and a nourishment solution within said open surface multidirectional porous framework comprises a comprises about a 50% of air and about a 50% of nourishment solution.

160. A sustentacular tissue culturing device according to claim 158 wherein said optimal balance of air and a nourishment solution within said open surface multidirectional porous framework comprises a ratio of air to nourishment solution selected from the group consisting of:

- about 20% air to about 80% nourishment solution;
- about 30% air to about 70% nourishment solution;
- about 40% air to about 60% nourishment solution;
- about 50% air to about 50% nourishment solution;
- about 60% air to about 40% nourishment solution;
- about 70% air to about 30% nourishment solution; and
- about 80% air to about 20% nourishment solution.

161. A sustentacular tissue culturing device according to claim 94, 95, 99, 103, 108, 111 or 116 and further comprising:
a plurality of explant transplant containers within which an explant growth is impacted by a punch-transplant device; and
a yieldable exit element established on a bottom of said plurality of explant transplant containers.

162. A sustentacular tissue culturing device according to claim 161 and further comprising a synthetic retentive capability.

163. A sustentacular tissue culturing device according to claim 162 and further comprising a proper balance of said synthetic retentive capability with a plant yield ability.

164. A sustentacular tissue culturing device according to claim 161 and further comprising a nourishment solution contained within said explant transplant containers.

165. A sustentacular tissue culturing device according to claim 161 wherein explant transplant containers comprises a dense population of said plurality of explants.

166. A sustentacular tissue culturing device according to claim 161 or 165 and further comprising post transplant containers in a less dense population than said explant transplant containers.

167. A sustentacular tissue culturing device according to claim 94, 95, 99, 103, 108, 111 or 116 and further comprising an automated tissue culturing system.